



SIERRA SCIENTIFIC CORPORATION

MAGNETIC DEFLECTION
GENERATOR
MODEL MDG-IV
MAY 18, 1976

★ AUG 77
ARBITRARY
WAVEFORM
& SCAN
CAMERAS

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PRELIMINARY DATA

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SCAN
SETUP

THE MDG CONCEPT

Most television cameras, including those made by Sierra Scientific, have deflection signals which must be operated in a repetitive mode at a single preset frequency at a set amplitude. While some variation is available—Sierra's automatic tracking horizontal deflection for example—equipment to provide for easy manipulation of deflection signals has not been available in a form easily adaptable to a wide range of television cameras.

The Magnetic Deflection Generator, Model MDG IV, provides the capabilities for easy manipulation of deflection signals through its dual channel wide band yoke driver amplifiers. These are operated from internal power supplies which provide high voltage compliance with the necessary current to drive low impedance yokes. The MDG IV has an optional dual ramp generator which provides independent horizontal and vertical drive waveforms. Both driver and ramp generator outputs are fed into a blanking and protect module which ensures that the beam current is cut off if either horizontal or vertical drive is missing. This protects the tube in the event of loss of sweep. The module also provides blanking during retrace, and it can be used to blank areas of the scan for special effects.

Scan Modes. The MDG IV may be used in several modes. These include:

Fixed raster scan, self generated. This makes use of the dual ramp generator, triggered by the vertical sweep card in the camera control unit. The drive pulses from the vertical sweep generator are used to trigger a pair of one shots, which generate the horizontal and vertical retrace pulses. Both retrace times are adjustable by variable resistors and selectable capacitors. The horizontal phase, with respect to the vertical, is adjusted on the vertical sweep card.

The one shot pulses are fed to a pair of plug-in integrators which shape them into ramps whose slopes are adjustable by controls on the integrator modules. The integrators also form the forward deflection ramps at the completion of the retrace pulse and in the interval between the end of one retrace and the beginning of the next. Again, slope is adjustable and there are also controls to insert a pulse at the beginning of the ramp. This pulse can be varied in amplitude, width and shape to compensate for the energy stored in the yoke. The ramps thus generated are amplified and converted to deflection currents by the yoke driver.

Variable Geometry raster scan - self generated.

In this mode, the ramps (sawtooth waveforms) from the dual ramp generator are operated on before being applied to the yoke driver power amplifiers. The ramps are brought out on the rear panels and can then be taken through additional circuits such as a zoom, rotate and translate box, before being amplified by the yoke drivers. Other geometric distortions or corrections may be applied: keystone, barrel, pincushion distortion may be corrected.

External Scan. The scanning waveforms may be generated externally, by a computer, for example. The dual ramp generator is not required in this application, but the source of the waveforms must also provide drive pulses to the camera. Function generators, clock driven D/A convertors are among the signal sources which have been used successfully.

Inputs and Outputs.

Several points of access to the MDG circuitry are provided to allow easy signal manipulation. Front panel test points for power supplies, generator outputs, sensor blanking and both high and low yoke driver outputs simplify troubleshooting. An external blanking input is available for remote image tube blanking. This is used if the scan signals are externally supplied or if integration on the image tube is desired. When this input is used, the image tube will be blanked until the voltage drops below 1 volt.

75 ohm, fixed-level signals for driving external displays are provided at the outputs of the dual ramp generator. As these signals are not affected by front panel controls, the raster on the display will be unaffected by adjustments made during camera setup. These signals may also be processed for special raster manipulation and then supplied to the yoke driver inputs.

The yoke driver inputs will accept scan signals and convert them into deflection currents with a transfer ratio of one ampere per volt with a 75 ohm input termination and a 75 ohm source.

If the MDG is to be run from a sync generator other than the one in the camera the two drive inputs should be used. These are negative edge triggered between -4 and -12 volts.

Functions

Dual Ramp Generator Module .

This module generates two independent sawtooth signals with adjustable rate and retrace time. Adjustable predistortion is provided to dump energy stored in the yoke shield material. The ramp signals used internally and those supplied to the rear panel connectors are isolated.

Frequency range	.3 Hz to 40 KHz
Retrace time (depends on yoke and current - adjustable)	2 seconds to 4 microseconds
Ramp Output level (adjustable)	1 volt into 75 ohms, internally calibrated, DC coupled.

It also supplies image tube blanking pulses for each channel.

Dual Yoke Driver Module.

This module translates the voltage ramp at its input to a current ramp at its output. Its transconductance is one ampere/volt at full gain with current limiting. Specifications are as follows:

Input Impedance	75 ohms
Output Current	1.5 amperes *

Power bandwidth at 1.5A p-p output, DC to 1 MHz *
Slew rate - 0.5 Amperes/microsecond into 130 microhenry.

A front panel warning light is illuminated if the output power transistors become overheated. The temperature at which the warning lamp comes on is approximately 25° C below the danger point for the transistors. The output circuits are fully protected by resettable electronic circuit breakers against shorts, opens and improper loads.

Blanking and Protect Module.

Pulses from each of the ramp generator channels are taken into the blanking and protect module and used to initiate blanking signals which are then summed with the external blanking input and supplied to an image tube blanking driver.

Sense lines connected to both high and low outputs of each yoke driver channel will detect loss of sweep voltage or current in one line or frame and blank the image tube. These protect circuits may be disconnected for non-repetitive scan configurations.

Power Requirements

100 - 130 VAC, 50-60 Hz standard, others on request. 175 watts at maximum output.

Important Note

Since the image tubes commonly used in these cameras are all of the charge storage type it is necessary to follow certain scanning rules if high-quality images are to be produced. These rules may be discussed with any Sierra representative.

*Design specifications

Models

MDG-IVC	Complete with dual ramp generator
MDG-IVE	External drive only



